

## **REMARKS**

Reconsideration of the subject application is respectfully requested.

### ***35 U.S.C. 102 and 103 Rejections***

#### **1. Little Fails to Anticipate Claim 1**

The Examiner states that “oxygen ions would inherently form in all areas of the glass when field assisted bonding is used, including at the intersection of the channels.” Claim 1, as amended, recites, inter alia, “a plurality of channels, located between said glass and silicon interface, defining a plurality of reaction sites where said channels intersect and having dangling bonds formed non-uniformly including at least at said reaction sites. . .” It is clear that Little neither teaches nor suggests non-uniform formation of dangling bonds, nor the existence of reaction sites. Even assuming arguendo, that the Examiner is correct that the use of field assisted bonding in Little in a vacuum or inert atmosphere would inherently result in the formation of some dangling bonds, such dangling bonds would be not be formed in accordance with above-identified claim limitations.

Accordingly, Applicant respectfully requests reconsideration and removal of the rejection of Claim 1 in view of Little.

#### **2. Little Fails To Anticipate Claims 2-4, 6-11 and 18-19**

Applicant respectfully requests reconsideration and removal of the rejections of Claims 2-4 and 6-11, as well, at least by virtue of these Claims' ultimate dependency upon a patentably distinct base Claim 1.

In similar fashion, independent claim 18 analogously recites borosilicate glass having dangling bonds formed non-uniformly, and providing localized reaction sites for

receiving organic molecules recited to be fabricated into a nanoscale molecular system. Little neither teaches nor suggests the above cited features and limitations of present Claim 18.

Reconsideration and removal of this rejection is requested. Applicant also respectfully requests reconsideration and removal of the rejection of Claim 19, at least least by virtue of this claim's ultimate dependency from a patentably distinct base Claim 18.

### 3. Little Fails To Anticipate Claim 20

Independent Claim 20 recites, "An apparatus for fabricating nanoscale molecular systems, comprising: ... at least one edge protruding into at least one of said channels and being suitable for inducing a localized high electric field." The Examiner has stated with respect to Claim 20 that Little discloses all of the same structural elements made up of the same materials and therefor would inherently be capable of producing a high electric field when a voltage is applied to the structure. In the Advisory Action dated April 25, 2006, the Examiner has illustrated edges and "a channel." This interpretation is not based on the specification of Little. Structure 26 of Little is variously referred to as a "channel" (col. 4, line 57) and as a "capillary expander." It is respectfully submitted that one of ordinary skill would understand each of the rectangular areas blackened by the Examiner in the Advisory Action to be a separate channel, and the "edges" defined by the Examiner as planar edges of those channels. The Examiner's proposed reading of the terms "channel" and "edge", in short, is broader than the broadest reasonable interpretation of the claims.

Applicant understands that the Examiner has withdrawn the position that an “edge” of Little would protrude into at least one of the channels by the channel being made up of a porous structure, as asserted in the final Office Action.

The Examiner has again provided a speculative interpretation of claim language, and has only explained this speculative interpretation on final rejection. This practice results in protracted prosecution.

Furthermore, Little does not disclose or suggest such an edge “suitable for inducing a localized high electric field.” Indeed, while the Final Office Action states that the elements would inherently be capable of producing a high electric field when a voltage is applied, it is only as a result of the claimed structure, namely “at least one edge protruding into at least one of said channels,” that a localized high electric field is produced. Little nowhere teaches a structure for producing a localized high electric field.

For at least the foregoing reasons, the rejection of claim 20 should be withdrawn.

4. Claims 5, 12, 13, 16 and 17 Are Patentable over the Combination of Little and Ashmead.

The rejection of claims 5, 12, 13, 16 and 17 over Little in view of Ashmead is respectfully traversed for at least the reason that one of ordinary skill in the art would not modify a micro miniature cryogenic device (i.e. refrigerator), as taught by Little, with features from a chemical processing apparatus as taught by Ashmead.

In the Advisory Action, the Examiner has stated that Ashmead teaches a very general micro-device which can perform heat exchange (refrigeration) also made up of silicon and borosilicate glass, and which can resist corrosion. The Examiner states that corrosion is a known problem in refrigeration devices. The Examiner offers by way of support U.S. Patent No. 6,660,107 (Ren) (col. 4, lines 11-17) as showing that corrosion

can be a problem in a refrigeration device. However, the cited portion of Ren states that corrosion is a problem in aluminum alloys. The structure of Little is not of aluminum; accordingly, Ren does not provide any motivation to apply the teachings of Ashmead to Little. Accordingly, no motivation has been shown for one of ordinary skill in the art to apply the teachings of a chemical processing apparatus of Ashmead to Little.

With specific reference to claim 5, the Examiner states that it is merely the selection of another shape of channel formed by etching known to be effective in micro-reactors. However, the inclusion of a shape of channel in Ashmead, which teaches a chemical processing apparatus, would not demonstrate to one of ordinary skill in the art that such a shape would be effective in a refrigerator, such as that taught by Little.

With specific reference to claims 12 and 16, the Examiner argues that a desire to improve corrosion resistance would motivate one of ordinary skill to look to Ashmead. However, the Examiner has failed to identify any teaching in the prior art that corrosion is even a problem in micro miniature cryogenic devices. Absent some suggestion or teaching that there is a problem of corrosion to be solved, there is no motivation for one of ordinary skill to apply the teachings of Ashmead.

In addition, the rejection is respectfully traversed on the grounds that each of claims 5, 12, 13, 16 and 17 depends from claim 1, which is allowable for at least the reasons set forth above.

5. Claim 17 Is Patentable over the Combination of Little, Ashmead and Christl, et al.

The rejection of claim 17 over the proposed combination of Little, Ashmead and Christl is traversed for at least the reasons that one of ordinary skill in the art would not be motivated to modify a micro miniature cryogenic device of Little using the teachings of Christl related to providing a corrosion-resistant coating for use in heat exchangers

that may be exposed to highly corrosive storable liquid rocket fuels (col. 1, lines 33-36). The Examiner has again taken the position that this argument is based on the doctrine of non-analogous art. However, the Examiner has failed to identify a problem of corrosion in micro miniature refrigeration units that would motivate one of ordinary skill in the art to look to corrosion resistant coatings that are suitable for use with highly corrosive rocket fuels.

In addition, the rejection is respectfully traversed on the grounds that claim 17 depends from claim 1, which is allowable for at least the reasons set forth above.

6. Claims 14 and 15 Are Patentable over the Combination of Little in view of Robillard, et al.

The rejection of Claims 14 and 15 over the proposed combination of Little and Robillard is traversed for at least the reasons that claims 14 and 15 depend from claim 1, which is allowable for at least the reasons set forth above.

7. New Claim 21 is Allowable.

New Claim 21 depends from Claim 1 and is allowable at least by virtue of its dependence from an allowable base claim. New Claim 21 further recites “wherein at least one of said channels contains the fluid containing the organic molecules, wherein the organic molecules react with said dangling bonds at at least one of said reaction sites and generate a nanoscale molecular system.” None of these limitations of new Claim 21 are taught or suggested by the prior art of record. For at least this additional reason, new Claim 21 is allowable.

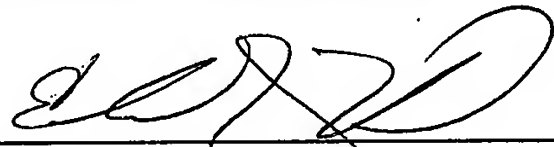
## CONCLUSION

Applicant believes he has addressed all outstanding grounds raised in the Final Office Action, and respectfully submits the present case is in condition for allowance, early notification of which is earnestly solicited.

In the event that the Examiner does not believe that this case is in condition for allowance, the Examiner is cordially invited and requested to contact Applicant's undersigned attorney at his number listed below to arrange a mutually convenient time for a telephone interview.

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Respectfully submitted,



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